
Sticky behaviour of selling, general, and administrative costs and earnings management practices: an international comparative perspective

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Abstract: The current study focuses on earnings management as a significant determinant of the sticky cost phenomenon, for explaining both firm-level cost behaviour and cross-country differences in cost behaviour. We combine firm-level incentives to manipulate earnings with country-level differences in earnings management practices to provide a richer understanding of the effects of these practices to cost stickiness. Using a sample of G-7 countries (France, Germany, Italy, Japan, Canada, the UK and the USA) we find that cost stickiness is mitigated in the pervasiveness of earnings management.

Keywords: sticky costs; cost behaviour; earnings management incentives; accounting quality; selling; general; administrative costs.

Reference to this paper should be made as follows: Balios, D., Eriotis, N., Naoum, V.C. and Vasiliou, D. (2020) 'Sticky behaviour of selling, general, and administrative costs and earnings management practices: an international comparative perspective', *Int. J. Managerial and Financial Accounting*, Vol. 12, Nos. 3/4, pp.242–264.

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1 Introduction

Traditionally, cost behaviour has attracted the attention of management accountants because understanding cost behaviour is a significant aspect of a firm's planning, controlling, and decision-making. The assumption in cost accounting literature was that the relation between costs and activity volume is mechanistic, contemporaneous and linear symmetric towards both volume increases and decreases (Noreen, 1991). This concept of cost behaviour treats costs as fixed or variable with respect to sales volume. While fixed costs are independent of the activity volume, variable costs behave linearly and proportionately to changes in the activity level.

Anderson et al. (2003) challenged this assumption by introducing a different way of thinking about cost behaviour. Focusing on the behaviour of selling, general and administrative expenses, they built a new concept named as 'cost stickiness' which postulates an explicit role for managers in affecting cost behaviour. Managers maintain idle resources after volume declines and as a result activity costs falling less with decreases in activity volume than rising with increases. According to this new theoretical model, costs are sticky if the magnitude of the increase in costs associated with an

increase in volume is greater than the magnitude of the decrease in costs associated with an equivalent decrease in volume.

According to the literature, managerial discretion is intricately linked with earnings management. There are different methods available to isolate the effects of managerial discretion on earnings management (Jones, 1991; Leuz et al., 2003; Gopalan and Jayaraman, 2012). Drawing on the earnings management literature we build on the concept of sticky costs by examining the following research question: Are the differences on the degree of cost asymmetry attributable cross-country and to firm-level differences on the earnings management practices? The subject of our study is the impact of the different management accounting practices on managerial cost behaviour and as a result on cost stickiness.

Although literature conjectures that sticky cost phenomenon is attributed to managerial behaviour, empirical evidence in this field is lacking. This study contributes to the growing literature of cost behaviour by providing support to the inference that cost behaviour is driven by managerial incentives (Chen et al., 2012; Kama and Weiss, 2013; Venieris et al., 2015). More specifically, it aims to contribute to the cost accounting literature by expanding the understanding of cost behaviour in the light of managerial deliberate commitment decisions driven by earnings management. Furthermore, cross-country comparisons are useful since they provide us with valuable information about factors related to cost stickiness that are constant within countries, but vary significantly across countries.

The findings suggest that earnings management is a significant explanation for the sticky cost theory, by documenting that the degree of cost asymmetry varies across countries and firms as a function of earnings manipulation's pervasiveness. This has significant managerial implications for the recognition and control of managerial agency driven decisions through a careful analysis of firm-level and cross-country differences in cost behaviour.

Moreover, this study extends the empirical results of the accounting quality literature, by providing a link between cost stickiness and a basic dimension of accounting quality, namely earnings management. Since sticky cost theory is an emerging stream of management accounting research which examines how managerial deliberate commitment decisions affect cost behaviour, we try to expand this inference by investigating the role of earnings management on intensity and the direction of cost stickiness in the case of SG&A expenses (Chen et al., 2012; Dierynck et al., 2012; Kama and Weiss, 2013). High quality accounting amounts are more reflective of a firm's underlining economics and aid investors with beneficial information. Therefore, the aforementioned linkage is useful for investors in forming more advantageous investment decisions since high (low) level of cost stickiness could be a positive (negative) signal about firm's accounting quality, suggesting limited (allowable) management's opportunistic discretion and consequently lower (higher) pervasiveness of earnings management. Consequently, the current study integrates two important streams of accounting research; sticky cost phenomenon which is a growing management accounting research topic and earnings management which is an important financial accounting topic (Weiss, 2010; Kama and Weiss, 2013).

The rest of this paper is organised as follows: In Section 2 we develop our hypotheses and in Section 3 we discuss the methodology used in the analysis. Section 4 and Section 5 describe the sample selection and the empirical results of our main tests, respectively. Finally Section 6 concludes.

2 Hypothesis development

2.1 Global nature of cost stickiness

Our first research question examines if the sticky cost behaviour is a global phenomenon. According to the literature, the degree of cost stickiness is expected to vary systematically across different cost accounts (Anderson et al., 2003; Subramaniam and Weidenmier, 2003; Chen et al., 2012; Balakrishnan et al., 2010), and industries (Balakrishnan et al., 2004; Balakrishnan and Gruca, 2008; Balakrishnan et al., 2010; Cohen et al., 2017). Most papers have focused primarily on US data. There are only a limited number of studies that examine the cost stickiness phenomenon in other countries. Using a sample of private Brazilian companies, Medeiros and Souza Costa (2004) tested the asymmetric behaviour of SG&A costs for Brazilian firms. Calleja et al. (2006) examined the stickiness of operating costs in the USA, the UK, French and German. Dierynck et al.'s (2012) study documented that Belgian firms exhibit labour cost asymmetry. Literature has explained the sticky costs theory with economic factors such as adjustment costs (Anderson et al. 2003; Calleja et al., 2006; Banker et al., 2013), anticipations for future sales (Banker and Byzalov, 2014; Banker et al., 2014; Balakrishnan et al., 2004; Subramaniam and Weidenmier, 2003), magnitude of economic activity change (Balakrishnan et al., 2004), agency issues (Chen et al., 2012; Dierynck et al., 2012; Kama and Weiss, 2013; Ballas et al., 2020) and intangible investments (Venieris et al., 2015). These factors that moderate the asymmetric cost response to sales volume changes are global. For this reason our first prediction focuses on the global nature of cost asymmetry, using a sample of the world's seven most industrialised economies that form the core of today's global economy (France, Germany, Japan, Italy, Canada, the UK and the USA)¹. We predict that in G-7 countries, the rate of increase in SG&A costs when revenues increase exceeds the rate of decrease when revenues decline. Therefore we define the first hypothesis:

H1 Firms in G-7 countries exhibit sticky cost behaviour, i.e., costs decrease less when activity levels decline than they rise when activity levels increase.

By documenting the asymmetric cost behaviour for a panel dataset of the G-7 countries, the analysis presented here introduces an empirically grounded discussion on the global nature of the sticky cost phenomenon.

2.2 Cost stickiness and earnings management

Subsequently, our study examines if earnings management practices influence firms' cost structures. According to Anderson et al. (2003), "sticky costs occur because managers deliberately adjust the resources committed to activities." Furthermore, Banker and Byzalov (2014) argue that the slack of unutilised resources depends not only on concurrent sales but also on agency and behavioural factors, which drive a wedge between firm's optimal resource commitments.

We rationalise the relationship between agency factors and the SG&A sticky behaviour within the sticky cost phenomenon's framework of Banker and Byzalov (2014). According to Banker and Byzalov's (2014) integrated explanatory framework managerial deliberate resource commitment decisions depend on the current period's

sales volume, the resource levels of the previous period, which determine the intensity and the level of adjustment costs, the anticipated level of future sales, which affects the level of future adjustment costs and the agency factors.

Drawing on the above integrated framework we examine the relationship between the sticky cost phenomenon and agency and behavioural factors in the case of SG&A expenses and earnings management. Focusing on managerial resource-allocation decisions we investigate cost behaviour in the light of country's and firm's intensity of earnings management practices and the underlying managerial behaviour. In this context, our research design is twofold. Firstly, we address the influence of earnings quality's cross-country differences in cost stickiness and secondly we document that earnings quality affects cost behaviour by conducting our analysis at firm-level.

The degree to which accounting practices are aligned with formal standards varies internationally. It depends on penalties under different enforcement institutions (Ball et al., 2000). According to the literature, accounting standards in code-law countries, such as France, Germany and Japan, give more discretion to managerial decision regarding the incorporation of economic gains and losses in accounting income. Furthermore, despite the fact that International Accounting Standards are internationally acceptable high-quality financial reporting standards, there is some controversy regarding the degree of stringency and compliance (Street et al., 1999; Rossi, 2014, 2015; Giacosa et al., 2016; Ipino and Parbonetti, 2017). Maijor and Vanstraelen (2006) found that audit environment and reliance on international capital markets affects the degree of earnings management. Allowable (limited) accounting alternatives decrease (increase) accounting quality by decreasing (increasing) management's opportunistic discretion in determining accounting amounts (Ashbaugh and Pincus, 2001). Leuz et al. (2003) and Burgstahler et al. (2006), using wide samples of countries, found large international differences in earnings management.

Firms in countries with increased pervasiveness in earnings management overstate the true level of earnings and hide unfavourable earnings realisations such as earnings losses or earnings decreases. These firms which use practices such as loss avoidance and earnings smoothing, are more willing to cut costs in response to a decline in sales revenue in order to avoid losses or earnings decreases. Furthermore, managers of firms that operate in countries with strong investor protection have limited private benefits of control and as a result they have fewer incentives to overstate the true level of firm's performance. Consequently, we assume that cost stickiness is more intense in countries with less earnings management. The aforementioned discussion leads to the following hypothesis:

H2 Countries with higher earnings quality exhibit greater degree of cost stickiness.

To test the above hypothesis we use an array of four different quality metrics (EM1, EM2, EM3, and EM4) that capture a variety of practices along which managers use their deliberate discrete decisions to manage earnings (Leuz et al., 2003).

Next we focus on earnings management as a significant determinant of the sticky cost phenomenon, for explaining firm-level cost behaviour. Hence we provide further support to the inference that earnings management affects the cost behaviour by conducting our analysis at firm-level.

As we mentioned, Banker and Byzalov (2014) argue that managerial decisions for resource commitments depend not only on concurrent sales but also on adjustment costs. The level of adjustment costs is affected by prior resource levels and expected future

sales. When sales volume changes, managers must weigh the adjustment costs of increasing or reducing the resource levels. For instance, when activity level decreases, they have to decide whether the adjustment costs associated with the resource level decrease (e.g., severance pay to fired workers, loss of productivity of the remaining workers, disposal costs of getting rid of machines) and with restoring resources when demand reverts (e.g., hiring and training of new workers, installation costs of adding new machines), are higher than costs of maintaining the slack capacity. In the case that there are higher downward adjustment costs, it is more beneficial for the firm to bear the costs of temporary slack capacity. Thus, the avoidance of cutting slack resources when sales fall, maximises firm's value. Nevertheless, when managers, who are driven by earnings management incentives, adjust committed resources, are more motivated to cut costs in the event of a revenue-decline, in order to avoid losses or meet earnings targets. Generally, they consider their personal utility, rather than the firm's value (Kama and Weiss, 2013). These accelerated cuts of unused resources result in lower cost stickiness.

Therefore, we predict that the severity of the earnings management, which is measured by an aggregate measure (EM), is negatively associated with the degree of cost asymmetry after controlling for the contributing factors of the sticky phenomenon. Based on the above prediction we define the following hypothesis:

H3 The degree of SG&A cost stickiness is negatively associated with the summary earnings management measure (EM).

To test Hypothesis 3 the basic model of cost stickiness is extended to include the aggregate earnings management measure (EM) which is indicative of the various dimensions of earnings manipulation (Gopalan and Jayaraman, 2012) as well as the factors that literature has proposed as contributing to sticky cost phenomenon. These proxies as well as the four earnings management measures, are analytically described in Section 3.1.

Hypotheses 2 and 3 focus on earnings management as a significant determinant of the sticky cost phenomenon, for explaining both firm-level cost behaviour and cross-country differences in cost behaviour. We combine firm-level incentives to manipulate earnings with country-level differences in earnings management practices to provide a richer understanding of the effects of these practices to cost stickiness.

3 Methodology and model specification

3.1 Earnings management proxies

In this section we describe the earnings management proxies used in our analysis. According to the literature there are two alternative methods available to isolate the effects of managerial discretion on earnings management. The first approach measures the amount of accrual-based earnings management using the discretionary accrual Jones (1991) model. This measure was used by Dierynck et al. (2012) as an additional test to determine the sensitivity of their findings. The second method includes the innate drivers of the earnings management proxies as controls in the regression specification. Guay et al. (1996) mentioned that discretionary accrual models (Jones, modified Jones) exhibit well-recognised problems regarding the causes of income smoothing. Consequently, following Gopalan and Jayaraman (2012), we use the latter approach to our analysis.

We use different measures of earnings management that capture a variety of practices along which managers can use their deliberate discrete decisions to manage earnings such as earnings smoothing and accrual manipulations (Leuz et al., 2003; Burgstahler et al., 2006; Gopalan and Jayaraman, 2012). A problem related to the measurement of earnings management is that firms' actual reporting practices are not evident due to the circumvention of the accounting rules made by insiders (Ball et al., 2003). According to Leuz et al. (2003), while these four measures capture the effects of the earnings management practices, they avoid this problem. Moreover, Lang et al. (2003), Wysocki (2004) and Lang et al. (2006) suggest that these measures, which behave in a reasonable fashion, are consistent with prevalent perceptions of earnings informativeness and they behave in a plausible fashion. Next, this paper presents and describes the construction of the four earnings management measures.

According to literature, greater earnings smoothing is associated with less earnings variability (Lang et al., 2003; Leuz et al., 2003; Ball and Shivakumar, 2005, 2006; Lang et al., 2006). Thus the first proxy captures the degree to which managers exercise their discretion to dampen the fluctuations ('smooth') of reported earnings and show steady annual profits via altering accruals (income smoothing – variability of earnings relative to the variability of cash flows).

This measure (EM1) is defined as the country's median ratio of the firm-level standard deviation of operating earnings and the firm-level standard deviation of operating cash flow. Both terms scaled by lagged total assets. The standard deviation of operating earnings is scaled by the standard deviation of operating cash flow to better control for differences in the variability of economic performance across firms (Leuz et al., 2003). Lower volatility of earnings relative to the volatility of cash flows resulting in smaller values of EM1, is indicative of greater income smoothing by managers' accounting discretion.

Following Leuz et al. (2003) and Gopalan and Jayaraman (2012), we define operating cash flows by subtracting the accruals from the operating income.⁴ The first earnings management measure (EM1) is defined as:

$$\text{EM1} = \frac{\sigma(\text{Income})}{\sigma(\text{CFO})} \quad (1)$$

The notion underlying the second metric is that managers use accruals to a greater extend in order to mask the firm's true economic performance through their reporting discretion (Leuz et al., 2003). In order to beat key earnings targets or handle special occasions, such as an equity issuance, managers overstate reported earnings or report extraordinary performance using reserves or aggressive revenue recognition practices. Consequently, earnings are boosted, while cash flows are unswayed. Thus in the second earnings management measure, the magnitude of accruals is used as a proxy which captures the degree to which managers use their deliberate discrete decisions in the reported earnings. High values of this measure indicate that earnings management is more intense.

Thus, the second metric (EM2) is defined as the median ratio of the absolute value of accruals and the absolute value of the operating cash flows. The absolute value of accruals is scaled by the absolute value of the operating cash flows to better control for firm's performance, since accruals are likely to be affected by this.

$$EM2 = \frac{|\text{Accruals}|}{|\text{Operating cash flow}|} \quad (2)$$

According to Dechow (1994), Lang et al. (2003), Leuz et al. (2003), Ball and Shivakumar (2005, 2006) and Lang et al. (2006) a negative correlation between changes in accounting accruals and changes in operating cash flows, as indicating earnings smoothing, follows naturally from the accrual accounting. Managers use their discretionary decisions over the recognition of accruals in order to manipulate earnings. For instance, they hasten the recognition of future earnings or postpone the recognition of expenses through their reporting choices. These opportunistic practices result in negative correlation between changes in accruals and operating cash flows.

Therefore the third measure of earnings management (second measure of income smoothing) is the contemporaneous correlation between changes in accounting accruals and changes in operating cash flows. While a negative correlation is a natural result of accrual accounting (Dechow, 1994), larger magnitudes of this correlation depict income smoothing that does not reflect a firm's reported economic performance (Skinner and Myers, 1999).

This earnings management proxy (EM3) is defined as the Spearman correlation between the change in accruals and the change in the operating cash flows. Both terms scaled by lagged total assets. Higher values of the EM3 measure imply less earnings management.

$$EM3 = \text{Spearman correlation}(\Delta \text{Accruals}, \Delta \text{Operating cash flow}) \quad (3)$$

The last manifestation of earnings management is based on the avoidance of reporting small losses. According to Degeorge et al. (1999) and Burgstahler and Dichev (1997), managers have limited discretion and they report profits only in the presence of small losses. Consequently, small profits relative to small losses capture the extent to which firms use accounting discretion to avoid losses.

For this reason the ratio of small reported profits to small reported losses is used as an earnings management proxy that captures the degree to which managers manipulate the firm's performance to avoid reporting losses. Higher values of this proxy are indicative of greater manipulation.

$$EM4 = \frac{\text{Number of small profits}}{\text{Number of small losses}} \quad (4)$$

3.2 Cost stickiness model development

Most empirical studies employ Anderson et al.'s (2003) approach to document cost stickiness. This model which incorporates the economic determinants proposed by the literature as control variables, estimates the magnitude of variation on SG&A expenses with respect to contemporaneous variations in sales:

$$\begin{aligned}
\log\left(\frac{\text{SG\&A}_{i,t}}{\text{SG\&A}_{i,t-1}}\right) = & b_0 + b_1 \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) + b_2 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \\
& + b_3 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \log\left(\frac{\text{Emp}_{i,t}}{\text{Rev}_{i,t}}\right) + b_4 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \log\left(\frac{\text{Assets}_{i,t}}{\text{Rev}_{i,t}}\right) \\
& + b_5 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) ds_{i,t} + b_6 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) GNP_t + b_7 \log\left(\frac{\text{Emp}_{i,t}}{\text{Rev}_{i,t}}\right) \\
& + b_8 \log\left(\frac{\text{Assets}_{i,t}}{\text{Rev}_{i,t}}\right) + b_9 ds_{i,t} + b_{10} GNP_t + \varepsilon_{i,t}
\end{aligned} \tag{5}$$

The primary variables used in this model are the annual log change in SG&A costs ($\text{SG\&A}_{i,t}$) and the annual log change in sales revenue ($\text{Rev}_{i,t}$). It also incorporates a dummy variable ($d_{i,t}$) which takes the value of one when sales of firm i in year t are less than those in year $t-1$ and zero otherwise. The log ratio of number of employees ($\text{Emp}_{i,t}$) to sales revenue ($\text{Rev}_{i,t}$) and total assets ($\text{Assets}_{i,t}$) to sales revenue measure firm's employee and asset intensity respectively. Firms with higher employee and asset intensity exhibit greater degree of cost stickiness (Anderson et al., 2003). These firms face higher adjustment costs, because they use more employees to support a given volume of sales and they rely more on its own resources than on materials and services purchased by the company. Consequently, managers are more reluctant to cut costs in the event of a revenue-decline, resulting in more intense sticky cost behaviour. Two further economic determinants that used as control variables are $ds_{i,t}$ and GNP_t . The first one ($ds_{i,t}$) is a dummy variable that takes the value of 1 if sales revenue decreases for two consecutive periods, and 0 otherwise. GNP_t is the percentage growth in real gross national product during year t .

Because the value of $d_{i,t}$ is 0 when revenue increases, the coefficient b_1 measures the percentage increase in SG&A costs following a 1% increase in sales revenue. The coefficient b_2 is the cost stickiness measure and the sum of the coefficients $b_1 + b_2$ measures the percentage decrease in SG&A costs following a 1% decrease in sales revenue (because the value of $d_{i,t}$ is 1 when revenue decreases). The empirical hypothesis for cost stickiness implies that $b_1 > 0$ and $b_2 < 0$ ($b_1 > b_1 + b_2$).

To test Hypothesis 1, model (1) is estimated for a panel data sample from G-7 countries. Regarding Hypothesis 2 we firstly estimated the country scores for the earnings management measures. We rank the G-7 countries such that a higher score for each of the four proxies implies higher degree of earnings manipulation. Then we compute an aggregate earnings management score which is the average rank across the four earnings management proxies (Table 2). Subsequently we estimate model (1) for each country of the sample.

In order to test Hypothesis 3 we express the coefficient for the interaction term b_2 of the basic model (1) as a function of the summary measure of earnings management (EM), as well as the factors that literature has proposed as contributing to cost stickiness phenomenon:

$$\begin{aligned}
\log\left(\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}}\right) = & b_0 + b_1 \log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) + b_2 d_{i,t} \log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) \\
& + b_3 d_{i,t} \log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) \log\left(\frac{Emp_{i,t}}{Rev_{i,t}}\right) + b_4 d_{i,t} \log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) \log\left(\frac{Assets_{i,t}}{Rev_{i,t}}\right) \\
& + b_5 d_{i,t} \log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) ds_{i,t} + b_6 d_{i,t} \log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) GNP_t \\
& + b_7 d_{i,t} \log\left(\frac{Rev_{i,t}}{Rev_{i,t-1}}\right) EM_{i,t} + b_8 \log\left(\frac{Emp_{i,t}}{Rev_{i,t}}\right) + b_9 \log\left(\frac{Assets_{i,t}}{Rev_{i,t}}\right) + b_{10} ds_{i,t} \\
& + b_{11} GNP_t + b_{12} EM_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{6}$$

According to equation (6) the degree of cost stickiness increases with the magnitude of the negative value of b_2 .

As we mentioned above, EM is indicative of the various dimensions along which managers can exercise their deliberate decisions to manage reported earnings. It is computed by combining the first two earnings management proxies (EM1, EM2)⁵. In order higher values of EM to indicate greater earnings management, the EM1 is modified. Then it is combined with EM2 using principal component analysis (Gopalan and Jayaraman, 2012).

3.3 Additional analysis and sensitivity testing

In this section we consider additional analysis to determine the sensitivity of our findings and provide further support to the inference that earnings management influences sticky cost phenomenon.

We repeat our analysis using an approach which measures the amount of accrual-based earnings management using the discretionary accrual Jones (1991) model. He used the discretionary portion of total accruals to capture earnings management. Total accruals are calculated as the difference between earnings before extraordinary items and discontinued operations and cash flow from operations. Consequently, we re-estimate equation (5) after expressing the coefficient for the interaction term b_2 as a function of the abnormal accruals.

4 Sample selection and descriptive statistics

Our sample comprises the world's seven most industrialised economies that form the core of today's global economy (G-7 countries). It is a well-represented sample by firms from both code law countries (Germany, France, Italy, Japan) as well as common law countries (the USA, the UK, Canada).

The variables used in our analysis are downloaded from the Worldscope Database. Detailed definitions of the variables are summarised in the appendix. The data sample covers the time period from 1995 to 2015. Because of problems of comparability banks and financial institutions are excluded from the empirical analysis. We also exclude observations for firms with no positive sales revenues and SG&A costs and the observations where sales revenues are less than SG&A costs. Following Anderson and

Lanen (2007) and Chen et al. (2012), we discard observations where SG&A expenses move in the opposite direction of sales.

We present the descriptive statistics for the sample firms and countries at Table 1. The availability of the complete financial accounting data and the differences in the country size cause a significant variation in the number of firm-year observations across countries.

Table 1 Descriptive statistics

	<i>Number of obs.</i>	<i>Mean SG&A expenses</i>	<i>Mean sales revenues</i>	<i>Mean total assets</i>	<i>Mean number of employees</i>
Germany	2,813	638,851.5	2,413,088	4,849,560	11,538.27
Japan	15,811	42,300,000	246,000,000	410,000,000	4,737.462
Italy	2,958	376,197.1	1,622,807	3,695,692	6,854.426
France	913	1,350,250	1,918,538	2,655,787	10,377.36
Canada	2,124	180,571.3	1,524,503	2,453,176	5,368.482
USA	13,174	769,537.8	3,966,739	5,552,383	16,862.77
UK	17,616	106,147.3	749,861.6	1,045,593	5,919.441

The descriptive statistics for the four earnings management measures as well as the aggregate score are summarised at Table 2. The G-7 countries are presented in descending order according to their aggregate score. The first two columns introduce the two income smoothing measures (EM1, EM3) and the next two the earnings discretion measures (EM2, EM4). The last column present the aggregate score which is the average rank across the four earnings management proxies. Code law countries have higher aggregate earnings management score than common law regimes.

Table 2 Earnings management measures – descriptive statistics

	<i>Earnings smoothing measures</i>		<i>Earnings discretion measures</i>		<i>Aggregate score</i>
	<i>EM1</i>	<i>EM3</i>	<i>EM2</i>	<i>EM4</i>	
Germany	0.36011	-0.78098	0.77062	3.50397	6
Japan	0.49887	-0.86108	0.51328	3.88642	5.75
Italy	0.56814	-0.85822	0.63675	3.06508	5.25
France	0.59669	-0.80836	0.56936	2.96022	4.25
Canada	0.48632	-0.66470	0.46839	2.03645	3
USA	0.63755	-0.76808	0.36455	2.10331	1.5
UK	0.64272	-0.74985	0.42971	1.85229	1.5
Mean	0.54148	-0.78446	0.53609	2.77253	
Median	0.56814	-0.78098	0.51328	2.96022	
Standard deviation	0.10082	0.06794	0.13668	0.78878	
Min	0.36011	-0.86108	0.36455	1.85229	
Max	0.64272	-0.66470	0.77062	3.88642	

5 Empirical results

Following Petersen (2009), all our models are estimated by using firm-clustered standard errors to control for heteroskedasticity and correlation problems associated with panel data. Table 3 provides the results from model (5), which is estimated for a panel data sample of G-7 countries. As expected the coefficient b_1 is significantly positive and the cost stickiness coefficient b_2 is negative and significant at the one percent level. This supports the SG&A cost asymmetry. More specifically, SG&A costs increase by about 0.76% per 1% increase in sales revenue ($b_1 = 0.765$) and decrease by about 0.65% ($b_1 + b_2 = 0.65$) when sales revenue decrease 1%. These results provide strong support to Hypothesis 1. Furthermore, the significantly negative coefficients on employee intensity (-0.045) and on asset intensity (-0.159) indicate that SG&A cost asymmetry is higher in firms with more employees to support a given volume of sales (employee intensity) and in firms that rely more on their own assets (asset intensity). However the signs for the coefficients b_5 and b_6 are inconsistent with these of Anderson et al.'s (2003) work. A possible reason for this is the differentiation of the samples.

Table 4 presents the results of the estimated model (5) for each of the G-7 countries. The estimated values of b_1 range from 0.518 (for the UK-listed firms) to 0.829 (for Italian-listed firms) and the estimated values of b_2 range from -0.465 (for the US-listed firms) to -0.175 (for German-listed firms). SGA costs are markedly more sticky for the UK and the USA than for German and Japanese firms. In the first two countries SGA costs decrease by 0.144 ($b_1 = 0.518$, $b_2 = -0.374$) and 0.297% ($b_1 = 0.762$, $b_2 = -0.465$), while in Germany and Japan they decrease by 0.621 ($b_1 = 0.796$, $b_2 = -0.175$) and 0.438% ($b_1 = 0.776$, $b_2 = -0.338$) respectively. According to Table 2, Germany and Japan have higher values of the aggregate score which is indicative of greater earnings management. On contrary in the UK and the USA earnings manipulation is less pervasive (lower values of the average score).

Taken together, the empirical results in Tables 2 and 4 provide consistent support for Hypothesis 2 by showing that SG&A expenses exhibit greater stickiness in countries with less intense earnings management. If we take a closer look, code law regimes (Germany, Japan, Italy and France) have higher aggregate earnings management score and exhibit lower degree of cost stickiness than common law countries (the US, the UK, Canada). This is consistent with Leuz et al.'s (2003) approach that in code-law countries managers have greater private control benefits and as a result stronger incentives to mask firm's performance. As a consequence, they are more willing to cut costs in response to a decline in sales revenue in order to avoid losses or earnings decreases. Contrary in common law countries, where the shareholders enjoy greater protection (La Porta et al., 1998), firms are associated with lower degree of earnings manipulation and as a result cost stickiness is more intense.

The results of the firm-level analysis with regard to the impact of the earnings management practices on cost stickiness are presented in Table 5. Hypothesis 3 predicts that the degree of SG&A cost asymmetry decreases with earnings management. Based on the above, we expect the coefficient on the earnings management interaction term (EM) to be positive. As shown in Table 5, b_7 is significantly positive at 0.01 level ($b_7 = 0.025$), suggesting that SG&A cost asymmetry decreases when earnings management (EM) is higher. These results provide strong support to Hypothesis 3.

Table 3 Cost stickiness – G-7 panel data sample

Regression specifications are the following:

$$\begin{aligned}
 \log\left(\frac{\text{SG\&A}_{i,t}}{\text{SG\&A}_{i,t-1}}\right) = & b_0 + b_1 \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) + b_2 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \\
 & + b_3 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \log\left(\frac{\text{Emp}_{i,t}}{\text{Rev}_{i,t}}\right) + b_4 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \log\left(\frac{\text{Assets}_{i,t}}{\text{Rev}_{i,t}}\right) \\
 & + b_5 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) d_{i,t} + b_6 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \text{GNP}_t + b_7 \log\left(\frac{\text{Emp}_{i,t}}{\text{Rev}_{i,t}}\right) + b_8 \log\left(\frac{\text{Assets}_{i,t}}{\text{Rev}_{i,t}}\right) \\
 & + b_9 d_{i,t} + b_{10} \text{GNP}_t + \varepsilon_{i,t}
 \end{aligned}$$

b_0	Constant	0.019*** (16.09)
b_1	$\log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1})$	0.765*** (100.19)
Two-way interaction term		
b_2	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1})$	-0.115*** (-5.24)
Three-way interaction terms		
b_3	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \log(\text{Emp}_{i,t} / \text{Rev}_{i,t})$	-0.045*** (-5.68)
b_4	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \log(\text{Assets}_{i,t} / \text{Rev}_{i,t})$	-0.159*** (-4.46)
b_5	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * d_{i,t}$	-0.057*** (-3.88)
b_6	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \text{GNP}_t$	0.028*** (7.85)
Main terms		
b_7	$\log(\text{Emp}_{i,t} / \text{Rev}_{i,t})$	0.002*** (6.11)
b_8	$\log(\text{Assets}_{i,t} / \text{Rev}_{i,t})$	0.004*** (2.92)
b_9	$d_{i,t}$	-0.027*** (-25.27)
b_{10}	GNP_t	0.001*** (3.28)
Number of observations		54,667
Adj. R-squared		0.656

Notes: 1 – The table presents coefficients and the associated t-statistics (in parentheses).

2 – *, **, *** indicates 10%, 5% and 1% levels of significance respectively.

Table 4 Cost stickiness and earnings management (country-level analysis)

Regression specifications are the following:							
$\log\left(\frac{\text{SG\&A}_{it}}{\text{SG\&A}_{it-1}}\right) = b_0 + b_1 \log\left(\frac{\text{Rev}_{it}}{\text{Rev}_{it-1}}\right) + b_2 d_{it} \log\left(\frac{\text{Rev}_{it}}{\text{Rev}_{it-1}}\right) + b_3 d_{it} \log\left(\frac{\text{Rev}_{it}}{\text{Rev}_{it-1}}\right) \log\left(\frac{\text{Emp}_{it}}{\text{Rev}_{it-1}}\right) + b_4 d_{it} \log\left(\frac{\text{Rev}_{it}}{\text{Rev}_{it-1}}\right) \log\left(\frac{\text{Assets}_{it}}{\text{Rev}_{it-1}}\right) + b_5 d_{it} \log\left(\frac{\text{Rev}_{it}}{\text{Rev}_{it-1}}\right) \log\left(\frac{\text{Assets}_{it}}{\text{Rev}_{it-1}}\right) + b_6 d_{it} \log\left(\frac{\text{Rev}_{it}}{\text{Rev}_{it-1}}\right) \log\left(\frac{\text{Emp}_{it}}{\text{Rev}_{it-1}}\right) \log\left(\frac{\text{Assets}_{it}}{\text{Rev}_{it-1}}\right) + b_7 \log\left(\frac{\text{Emp}_{it}}{\text{Rev}_{it-1}}\right) \log\left(\frac{\text{Assets}_{it}}{\text{Rev}_{it-1}}\right) + b_8 \log\left(\frac{\text{Assets}_{it}}{\text{Rev}_{it-1}}\right) + b_9 d_{it} \log\left(\frac{\text{Assets}_{it}}{\text{Rev}_{it-1}}\right) + b_{10} \text{GNP}_i + \varepsilon_{it}$							
		Germany	Japan	Italy	France	Canada	USA
b ₀	Constant	0.047*** (4.49)	0.016*** (3.35)	0.007 (0.58)	0.001 (0.04)	0.031*** (2.17)	0.021*** (6.75)
b ₁	$\log(\text{Rev}_{it} / \text{Rev}_{it-1})$	0.796*** (29.34)	0.776*** (61.35)	0.829*** (18.63)	0.734*** (10.14)	0.584*** (18.03)	0.762*** (79.62)
Two-way interaction term							
b ₂	$d_{it} * \log(\text{Rev}_{it} / \text{Rev}_{it-1})$	-0.175** (-2.02)	-0.338*** (-9.51)	-0.462*** (-3.38)	-0.401*** (-3.01)	-0.270** (-2.31)	-0.465*** (-13.64)
Three-way interaction terms							
b ₃	$d_{it} * \log(\text{Rev}_{it} / \text{Rev}_{it-1}) * \log(\text{Emp}_{it} / \text{Rev}_{it-1})$	-0.394*** (-5.82)	-0.058*** (-6.67)	-0.168*** (-2.51)	-0.263*** (-4.06)	-0.380*** (-5.43)	-0.402*** (-12.89)
b ₄	$d_{it} * \log(\text{Rev}_{it} / \text{Rev}_{it-1}) * \log(\text{Assets}_{it} / \text{Rev}_{it-1})$	-0.189 (-0.19)	-0.224* (-1.77)	-0.125* (-1.82)	-0.82 (-1.15)	0.106 (1.42)	0.034*** (3.76)
UK							
							0.010*** (2.40)
							0.518*** (37.06)
							(-6.10)

Notes: 1 – The table presents coefficients and the associated t-statistics (in parentheses).

2 – *, **, *** indicates 10%, 5% and 1% levels of significance respectively.

Table 4 Cost stickiness and earnings management (country-level analysis) (continued)

	Germany	Japan	Italy	France	Canada	USA	UK
Three-way interaction terms							
b ₅ d _{i,t} * log(Rev _{i,t} / Rev _{i,t-1}) * dS _{i,t}	-0.769*** (-6.27)	-0.163*** (-6.95)	-0.035 (-0.67)	-0.348*** (-2.50)	-0.190* (-1.90)	-0.014* (-1.70)	0.220*** (3.07)
b ₆ d _{i,t} * log(Rev _{i,t} / Rev _{i,t-1}) * GNP _t	0.077** (2.14)	0.007* (1.78)	-0.012 (-1.29)	0.081*** (2.96)	0.018 (0.82)	0.054*** (4.51)	0.045*** (2.68)
Main terms							
b ₇ log(Emp _{i,t} / Rev _{i,t})	0.006 (1.42)	0.002* (1.66)	-0.002 (-0.50)	-0.005 (-0.59)	-0.003 (-0.53)	0.003*** (2.67)	-0.002 (-0.77)
b ₈ log(Assets _{i,t} / Rev _{i,t})	0.008 (1.20)	-0.004* (-1.75)	-0.002 (-0.23)	-0.012 (-0.95)	0.017** (2.44)	0.007*** (4.32)	0.007*** (2.90)
b ₉ dS _{i,t}	-0.069*** (-9.62)	-0.024*** (-25.53)	-0.010* (-1.70)	-0.041*** (-3.48)	-0.053*** (-6.55)	-0.014*** (-10.86)	0.013*** (4.21)
b ₁₀ GNP _t	0.000 (0.33)	0.000 (1.41)	-0.001 (-0.76)	0.002* (1.66)	0.001 (0.63)	0.001*** (2.59)	0.002*** (6.32)
Number of observations							
R-squared	2.813	15.811	2.958	913	2.124	13.174	17.616
	0.618	0.702	0.465	0.572	0.551	0.708	0.363

Notes: 1 – The table presents coefficients and the associated t-statistics (in parentheses).
 2 – *, **, *** indicates 10%, 5% and 1% levels of significance respectively.

Table 5 Cost stickiness and earnings management (firm-level analysis)

Regression specifications are the following:

$$\begin{aligned}
 \log\left(\frac{\text{SG\&A}_{i,t}}{\text{SG\&A}_{i,t-1}}\right) = & b_0 + b_1 \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) + b_2 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \\
 & + b_3 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \log\left(\frac{\text{Emp}_{i,t}}{\text{Rev}_{i,t}}\right) + b_4 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \log\left(\frac{\text{Assets}_{i,t}}{\text{Rev}_{i,t}}\right) \\
 & + b_5 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) d_{s,i,t} + b_6 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \text{GNP}_t + b_7 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \text{EM}_t \\
 & + b_8 \log\left(\frac{\text{Emp}_{i,t}}{\text{Rev}_{i,t}}\right) + b_9 \left(\frac{\text{Assets}_{i,t}}{\text{Rev}_{i,t}}\right) + b_{10} d_{s,i,t} + b_{11} \text{GNP}_t + b_{12} \text{EM}_t + \varepsilon_{i,t}
 \end{aligned}$$

b_0	Constant	0.022*** (16.54)
b_1	$\log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1})$	0.733*** (71.65)
Two-way interaction term		
b_2	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1})$	-0.176*** (-6.91)
Three-way interaction terms		
b_3	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \log(\text{Emp}_{i,t} / \text{Rev}_{i,t})$	-0.080*** (-6.56)
b_4	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \log(\text{Assets}_{i,t} / \text{Rev}_{i,t})$	0.199** (2.18)
b_5	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * d_{s,i,t}$	-0.602*** (-15.79)
b_6	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \text{GNP}_t$	0.296*** (14.79)
b_7	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \text{EM}_t$	0.025*** (5.07)
Main terms		
b_8	$\log(\text{Emp}_{i,t} / \text{Rev}_{i,t})$	0.002*** (7.55)
b_9	$\log(\text{Assets}_{i,t} / \text{Rev}_{i,t})$	0.010*** (5.35)
b_{10}	$d_{s,i,t}$	-0.030*** (-22.83)
b_{11}	GNP_t	0.001*** (3.17)
b_{12}	EM_t	0.004*** (6.21)
Number of observations		46,669
Adj. R-squared		0.686

Notes: 1 – The table presents coefficients and the associated t-statistics (in parentheses).
 2 – *, **, *** indicates 10%, 5% and 1% levels of significance respectively.

Table 6 Cost stickiness and earnings management (additional analysis)

Regression specifications are the following:

$$\begin{aligned}
 \log\left(\frac{\text{SG\&A}_{i,t}}{\text{SG\&A}_{i,t-1}}\right) = & b_0 + b_1 \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) + b_2 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \\
 & + b_3 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \log\left(\frac{\text{Emp}_{i,t}}{\text{Rev}_{i,t}}\right) + b_4 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \log\left(\frac{\text{Assets}_{i,t}}{\text{Rev}_{i,t}}\right) \\
 & + b_5 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) ds_{i,t} + b_6 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \text{GNP}_t + b_7 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \text{EM}_t \\
 & + b_8 \log\left(\frac{\text{Emp}_{i,t}}{\text{Rev}_{i,t}}\right) + b_9 \left(\frac{\text{Assets}_{i,t}}{\text{Rev}_{i,t}}\right) + b_{10} ds_{i,t} + b_{11} \text{GNP}_t + b_{12} \text{EM}_t + \varepsilon_{i,t}
 \end{aligned}$$

		<i>Code law countries</i>	<i>Common law countries</i>
b ₀	Constant	0.011 (1.04)	0.029 (1.28)
b ₁	$\log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1})$	0.812*** (38.50)	0.692*** (22.59)
Two-way interaction term			
b ₂	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1})$	-0.211*** (-6.86)	-0.363*** (-7.11)
Three-way interaction terms			
b ₃	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \log(\text{Emp}_{i,t} / \text{Rev}_{i,t})$	-0.028*** (-3.02)	-0.124*** (-14.12)
b ₄	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \log(\text{Assets}_{i,t} / \text{Rev}_{i,t})$	-0.007* (-1.84)	-0.082*** (-12.81)
b ₅	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * ds_{i,t}$	-0.215** (-2.52)	-0.151*** (-4.50)
b ₆	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \text{GNP}_t$	-0.013*** (-5.15)	0.121** (2.17)
b ₇	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \text{EM}_{i,t}$	0.010*** (4.09)	0.032*** (5.13)
Main terms			
b ₈	$\log(\text{Emp}_{i,t} / \text{Rev}_{i,t})$	0.004 (0.81)	-0.002 (-0.79)
b ₉	$\log(\text{Assets}_{i,t} / \text{Rev}_{i,t})$	0.002 (0.84)	0.010*** (4.09)
b ₁₀	$ds_{i,t}$	-0.012*** (-3.32)	-0.019*** (-13.09)
b ₁₁	GNP_t	0.003** (1.99)	-0.013 (-1.26)
b ₁₂	$\text{EM}_{i,t}$	0.002*** (6.11)	0.010*** (5.35)
Number of observations		20,152	26,094
Adj. R-squared		0.584	0.429

Table 7 Cost stickiness and earnings management (sensitivity analysis)

Regression specifications are the following:

$$\begin{aligned}
 \log\left(\frac{\text{SG\&A}_{i,t}}{\text{SG\&A}_{i,t-1}}\right) = & b_0 + b_1 \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) + b_2 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \\
 & + b_3 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \log\left(\frac{\text{Emp}_{i,t}}{\text{Rev}_{i,t}}\right) + b_4 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \log\left(\frac{\text{Assets}_{i,t}}{\text{Rev}_{i,t}}\right) \\
 & + b_5 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) d_{s,t} + b_6 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \text{GNP}_t + b_7 d_{i,t} \log\left(\frac{\text{Rev}_{i,t}}{\text{Rev}_{i,t-1}}\right) \text{Ab_Acc}_t \\
 & + b_8 \log\left(\frac{\text{Emp}_{i,t}}{\text{Rev}_{i,t}}\right) + b_9 \left(\frac{\text{Assets}_{i,t}}{\text{Rev}_{i,t}}\right) + b_{10} d_{s,t} + b_{11} \text{GNP}_t + b_{12} \text{Ab_Acc}_t + \varepsilon_{i,t}
 \end{aligned}$$

b ₀	Constant	0.019*** (18.16)
b ₁	$\log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1})$	0.768*** (113.69)
Two-way interaction term		
b ₂	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1})$	-0.183*** (-9.03)
Three-way interaction terms		
b ₃	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \log(\text{Emp}_{i,t} / \text{Rev}_{i,t})$	-0.065*** (-6.65)
b ₄	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \log(\text{Assets}_{i,t} / \text{Rev}_{i,t})$.051 (0.70)
b ₅	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * d_{s,t}$	-0.628*** (-19.97)
b ₆	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \text{GNP}_t$	0.296*** (17.50)
b ₇	$d_{i,t} * \log(\text{Rev}_{i,t} / \text{Rev}_{i,t-1}) * \text{Ab_Acc}_{i,t}$	0.054*** (4.51)
Main terms		
b ₈	$\log(\text{Emp}_{i,t} / \text{Rev}_{i,t})$	0.002*** (6.82)
b ₉	$\log(\text{Assets}_{i,t} / \text{Rev}_{i,t})$	0.006*** (4.38)
b ₁₀	$d_{s,t}$	-0.032*** (-27.84)
b ₁₁	GNP_t	0.001*** (3.50)
b ₁₂	$\text{Ab_Acc}_{i,t}$	0.001 (1.54)
Number of observations		
Adj. R-squared		

Notes: 1 – The table presents coefficients and the associated t-statistics (in parentheses).
 2 – *, **, *** indicates 10%, 5% and 1% levels of significance respectively.

Furthermore, we undertake additional analysis in order to determine the sensitivity of our findings concerning common and code law regimes and to provide further support to our inference that, earnings management mitigates the degree of SG&A cost stickiness. According to the literature (La Porta et al., 1997, 1998, 2000; Djankov et al., 2007; Balios and Zaroulea, 2020), one of the main drivers of country-level differences in corporate governance and external financing is the legal origin of a country (common versus code law regimes). These cross-country differences affect the firm-level cost behaviour (Banker et al., 2012).

Consequently, we rebalanced the data sample and rank the firms into two subgroups: one includes firms operating under a common-law system and another for firms operating under a code-law regime. More specifically, we perform our initial analysis [equation (6)] for two different datasets: common law countries (the USA, the UK, Canada) and code-law countries (Germany, Japan, Italy and France).

Table 6 sets out the results of running the model for each of the two sub-samples. Overall, the empirical findings support the sticky cost behaviour, across all seven countries, where managers adjust resources asymmetrically to changes in the level of sales volume. The level of cost stickiness is lower in code law dataset which is subject to code-law governance system. Common law countries exhibit higher levels of cost stickiness.⁷

Regarding the sensitivity test we repeat our analysis using the discretionary portion of total accruals to capture earnings management (Jones, 1991).⁸ Total accruals are calculated as the difference between earnings before extraordinary items and discontinued operations and cash flow from operations. The new findings from estimations of the extended model that incorporates this alternative measure of abnormal accruals indicate that inferences are unchanged.⁹

6 Conclusions

In this study we investigate how earnings management practices influence SG&A cost behaviour in a sample of G-7 countries. Our findings suggest that earnings management is a significant determinant of the sticky cost phenomenon. We combine firm-level incentives to manipulate earnings with country-level differences in earnings management practices to provide a richer understanding of the effects of these practices to cost stickiness.

Drawing on the integrated framework of Banker and Byzalov (2014) which incorporates the recent theoretical developments of sticky cost phenomenon, we focus on earnings management practices to expand our understanding of cost behaviour in the light of managerial deliberate commitment decisions. We find that the degree of SG&A cost asymmetry is higher in countries with less intense earnings management. Also we provide further support to the inference that earnings management affects the cost behaviour by conducting our analysis at firm-level. Our finding provide strong evidence that cost asymmetry is negatively associated with an overall earnings management measure which captures a variety of practices along which managers can use their deliberate discrete decisions to manipulate earnings. Our findings endow the growing sticky cost theory with an additional significant factor, by providing large sample empirical evidence for the influence of earnings management in moderating the SG&A cost stickiness. By documenting the asymmetric cost behaviour for a panel dataset of the

G-7 countries, the analysis presented here also introduces an empirically grounded discussion on the global nature of the sticky cost phenomenon.

This study contributes to the accounting literature by providing support to the inference that cost behaviour is driven by managerial incentives. More specifically, it expands the understanding on how managerial deliberate commitment decisions and particularly decisions that are driven by earnings management incentives, affect the asymmetric cost behaviour. A managerial implication of this inference is that a better understanding of firm-level and cross-country differences in cost behaviour, through sticky cost phenomenon, contributes to the recognition and control of earnings management practices. Our evidence is also useful for investors in forming their beliefs about firm's value. Literature suggests that investors misvalue firms with intense earnings manipulation. They should consider sticky cost behaviour in their investment decisions, since low (high) level of cost stickiness could be a negative (positive) signal about firm's accounting quality, suggesting higher (lower) pervasiveness of earnings management. Overall, by examining the linkage between cost stickiness and earnings management, our study provides useful insight for both management and financial accountants.

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Notes

- 1 Furthermore, as Lo and MacKinley (1990) point out, the use of data from non-US major markets, offers better and more independent empirical findings by minimising the data snooping.
- 2 The country's median ratio is only used at the country-level analysis.
- 3 At the firm-level analysis, we use rolling window of five annual observations for the calculation of standard deviations.
- 4 This is an indirect way of calculating the cash flows of operations because in many countries there is no availability of firms' cash flows.

- 5 The third and the fourth earnings management measures (EM3, EM4) are not used at the firm-level analysis because according to Gopalan and Jayaraman (2012), they are better estimated at country-level.
- 6 Across common law countries when revenue decreases by 1% the average decrease in SG&A costs is 0.440%, while in code law countries the decrease is 0.252%.
- 7 We also include a common-law dummy (equal to one for the USA, the UK and Canada) and the results remain qualitatively similar.
- 8 Our results remain qualitatively similar, if we instead extract discretionary accruals by the modified Jones model with performance match (ROA).
- 9 We add in equation (6) country fixed effects and year effects to control for country-specific factors that are unobserved. The results remain similar.

Appendix

Variable definitions

i	Firm index
t	Year index
Income	Operating income
CFO	Cash flow from operations
Number of small profits	A firm-year observation is classified as small profit if after tax earnings scaled by total assets falls within the range [0, 0.01]
Number of small losses	A firm-year observation is classified as small losses if after tax earnings scaled by total assets falls within the range [-0.01, 0]
EM1	First earnings management measure: is defined as the ratio of the standard deviation of operating income to the standard deviation of cash flows. Both terms scaled by lagged total assets.
EM2	Second earnings management measure: is defined as the median ratio of the absolute value of accruals and the absolute value of the operating cash flows.
EM3	Third earnings management measure: is defined as the Spearman correlation between the change in accruals and the change in the operating cash flows. Both terms scaled by lagged total assets.
EM4	Fourth earnings management measure: is defined as the ratio of small reported profits to small reported losses.
EM	Composite measure of earnings management: is defined as the average rank across all four measures.
SG&A	Selling, general and administrative expenses
Rev _{i,t}	Sales revenue
d _{i,t}	Dummy variable which takes the value of 1 when sales of firm i in year t are less than those in year t - 1 and zero otherwise
Emp _{i,t}	Number of employees
Assets _{i,t}	Total assets
ds _{i,t}	Dummy variable that takes the value of 1 if sales revenue decreases for two consecutive periods, and 0 otherwise
GDP _t	Percentage growth in real gross domestic product during year t
Ab_Acc _{i,t}	Abnormal accruals